farrell: An R Package for Interactive Data Envelopment Analysis.

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Introduction

The goal of farrell is to provide an interactive interface to Data Envelopment Analysis modeling in R. The farrell package is built upon Benchmarking.

Installation

You can install the development version of farrell with:

```r
remotes::install_github("feddelegrand7/farrell")
```
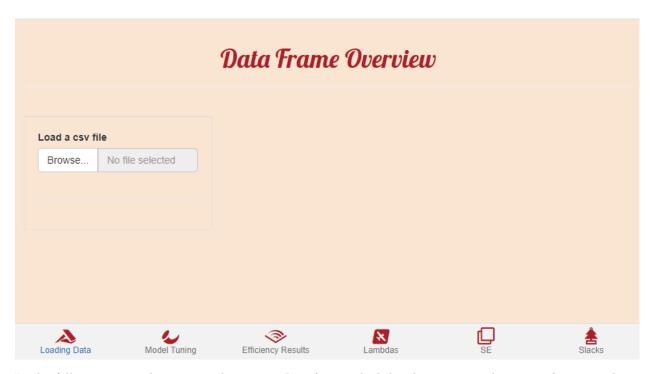
Example

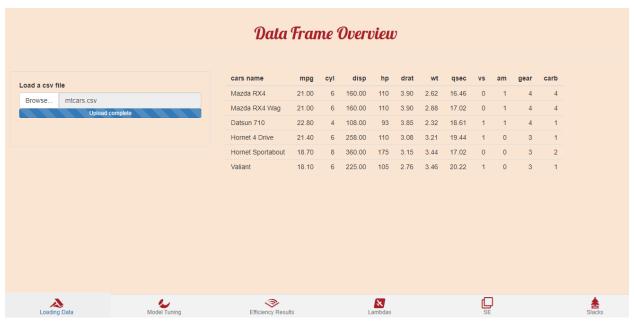You can run:

```r
library(farrell)

farrell()
```

or if you're working on RStudio, just click on **Addins** then **farrell**.
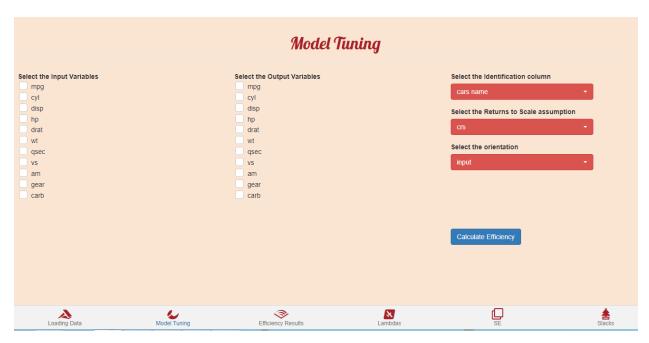
Data Loading:

Hit **Browse...** to upload your data frame in a csv format. All the inputs and outputs must be contained within the uploaded data frame. Further, the data frame needs to contain an identification column in order to identify Decision Making Units distinctively. It can be a numeric or a character column.

Data Frame Overview

Load a csv file

| Browse... | No file selected |

Loading Data   Model Tuning   Efficiency Results   Lambdas   SE   Slacks

In the following examples, we use the mtcars data frame which has been exported in a csv format with an additional column: **cars name**.

Data Frame Overview

Load a csv file

| Browse... | mtcars.csv |

Upload complete

cars name	mpg	cyl	disp	hp	drat	wt	qsec	vs	am	gear	carb
Mazda RX4	21.00	6	160.00	110	3.90	2.62	16.46	0	1	4	4
Mazda RX4 Wag	21.00	6	160.00	110	3.90	2.88	17.02	0	1	4	4
Datsun 710	22.80	4	108.00	93	3.85	2.32	18.61	1	1	4	1
Hornet 4 Drive	21.40	6	258.00	110	3.08	3.21	19.44	1	0	3	1
Hornet Sportabout	18.70	8	360.00	175	3.15	3.44	17.02	0	0	3	2
Valiant	18.10	6	225.00	105	2.76	3.46	20.22	1	0	3	1

Loading Data   Model Tuning   Efficiency Results   Lambdas   SE   Slacks
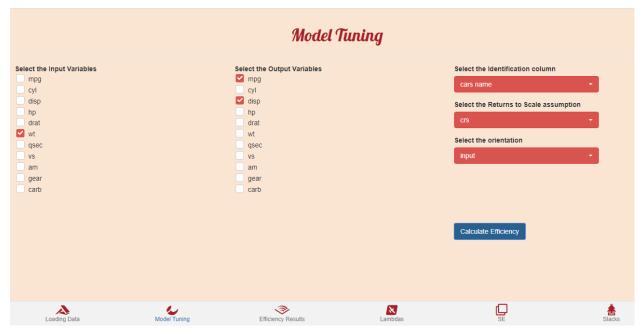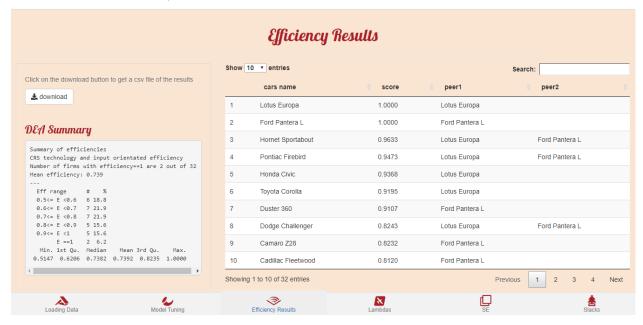
Model Tuning

Within the Model Tuning tab, you will select the input and output variables, then you determine your identification column. Then you choose the Returns to Scale assumption between: crs, vrs, irs, drs, add and fdh. After that, you determine the orientation of the model, whether input or output. Finally, hit **Calculate Efficiency** to get the results.

Let's for example consider **mpg** and **disp** as the output variables and **wt** as input. We choose **cars name** as the identification column and model an input-oriented model with crs assumption.

Efficiency Results

The Efficiency Results tab displays the efficiency scores along with the peers for each unit in a descending order. You have the ability to download the result in a csv format. The tab also provides a summary of the distribution of the efficiency scores.
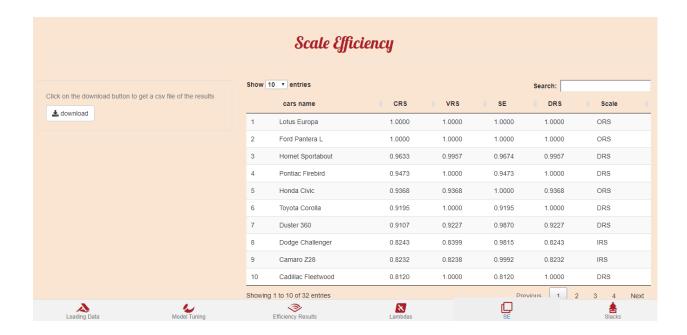

Lambdas

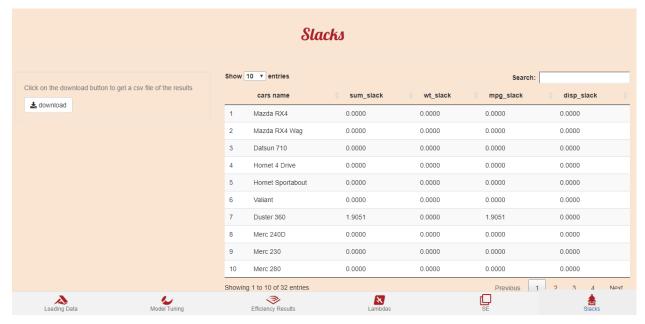In the Lambdas tab, you get the contribution of the peers to the inefficient units' score.

Scale Efficiency

The SE tab provides the Scale Efficiency score of each DMU under consideration.

Scale Efficiency

	cars name	CRS	VRS	SE	DRS	Scale
1	Lotus Europa	1.0000	1.0000	1.0000	1.0000	ORS
2	Ford Pantera L	1.0000	1.0000	1.0000	1.0000	ORS
3	Hornet Sportabout	0.9633	0.9957	0.9674	0.9957	DRS
4	Pontiac Firebird	0.9473	1.0000	0.9473	1.0000	DRS
5	Honda Civic	0.9368	0.9368	1.0000	0.9368	ORS
6	Toyota Corolla	0.9195	1.0000	0.9195	1.0000	DRS
7	Duster 360	0.9107	0.9227	0.9870	0.9227	DRS
8	Dodge Challenger	0.8243	0.8399	0.9815	0.8243	IRS
9	Camaro Z28	0.8232	0.8238	0.9992	0.8232	IRS
10	Cadillac Fleetwood	0.8120	1.0000	0.8120	1.0000	DRS

Click on the download button to get a csv file of the results

Showing 1 to 10 of 32 entries   Previous 1 2 3 4 Next

Slacks

The Slacks tab displays a data frame containing the sum of the slacks and the slacks for each input/output variables.

Slacks

	cars name	sum_slack	wt_slack	mpg_slack	disp_slack
1	Mazda RX4	0.0000	0.0000	0.0000	0.0000
2	Mazda RX4 Wag	0.0000	0.0000	0.0000	0.0000
3	Datsun 710	0.0000	0.0000	0.0000	0.0000
4	Hornet 4 Drive	0.0000	0.0000	0.0000	0.0000
5	Hornet Sportabout	0.0000	0.0000	0.0000	0.0000
6	Valiant	0.0000	0.0000	0.0000	0.0000
7	Duster 360	1.9051	0.0000	1.9051	0.0000
8	Merc 240D	0.0000	0.0000	0.0000	0.0000
9	Merc 230	0.0000	0.0000	0.0000	0.0000
10	Merc 280	0.0000	0.0000	0.0000	0.0000

Click on the download button to get a csv file of the results

Showing 1 to 10 of 32 entries   Previous 1 2 3 4 Next

Citation

If you use the farrell package in your publications or teaching activities, please cite as follows:

Mohamed El Fodil Ihaddaden (2020). farrell: Interactive Interface to Data Envelopment Analysis Modeling. R package version 0.1.0. https://github.com/feddelegrand7/farrell

A BibTeX entry for LaTeX users is

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Code of Conduct

Please note that the farrell project is released with a Contributor Code of Conduct. By contributing to this project, you agree to abide by its terms.